

Serial No. 09/923,477

PATENT  
Docket No. 58027-010400**AMENDMENTS TO THE CLAIMS**

**Claim 1 (currently amended):** A micro mixer having at least one means of creating a time-varying force field for inducing homogenization of a first and second sample component within a micro mixer channel at a rate greater than that of diffusion alone, and wherein the time-varying force field creates a transverse force upon a sample interface between the first and second sample component, whereby the homogenization of the first sample component and the second sample component is effected by chaotic motion between the components.

**Claim 2 (original):** A micro mixer of claim 1, wherein the time-varying force field used to generate a transverse force on a first sample component and a second sample component separated by a sample interface is at least one of a physical displacement field, electrical field, pressure field, or a magnetic field.

**Claim 3 (cancelled)**

**Claim 4 (cancelled)**

**Claim 5 (original):** The micro mixer of claim 2 wherein the electrical field is created by an AC or a DC source.

**Claim 6 (original):** A micro mixer of claim 5, wherein the electrical field creates a transverse force using at least one electrode adjacent to the micro mixer channel, and wherein the electrode is activated to a selected first voltage and subsequently modulated to a second selected voltage at a selected interval to induce electrokinetic perturbations in the sample interface.

**Claim 7 (original):** A micro mixer of claim 6, wherein the second selected voltage is zero volts.

**Claim 8 (original):** A micro mixer of claim 5, wherein the electrical field creates a transverse force using at least one electrode adjacent to the micro mixer channel, wherein the electrode is activated to a first selected frequency and subsequently modulated to a second selected frequency to induce electrokinetic perturbations in the sample interface.

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**Claim 9 (original):** A micro mixer of claim 5, wherein the electrical field creates a transverse force by application of at least a first voltage at a first frequency by a first electrode and application of at least a second voltage at a second frequency by a second electrode, and wherein the first voltage and/or first frequency of the first electrode is modulated at a selected interval, and wherein the second voltage and/or second frequency of the second electrode is not modulated.

**Claim 10 (original):** A micro mixer of claim 5, wherein the electrical field creates a transverse force by alternate application of a at least first voltage at a first frequency between a pair of electrodes and a second voltage at a second frequency between the pair of electrodes.

**Claim 11 (original):** A micro mixer of claim 5, wherein the electrical field creates a transverse force by alternate application of a at least first voltage between a first pair of electrodes and a second voltage between a second pair of electrodes.

**Claim 12 (original):** A micro mixer of claim 5, wherein the electrical field creates a transverse force by alternate application of a at least first voltage at a first frequency between a first pair of electrodes and a second voltage at a second frequency between a second pair of electrodes.

**Claim 13 (cancelled)**

**Claim 14 (cancelled)**

**Claim 15 (cancelled)**

**Claim 16 (cancelled)**

**Claim 17 (cancelled)**

**Claim 18 (original):** A micro mixer of claim 2, wherein the transverse force is at an angle of 90° to the sample interface.

**Claim 19 (original):** A micro mixer of claim 2, wherein the transverse force is at an angle of less than 90° to the sample interface.

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**Claim 20 (original):** A micro mixer of claim 1, wherein the micro mixer is open chambered.

**Claim 21 (original):** A micro mixer of claim 1, wherein the micro mixer is close chambered.

**Claim 22 (currently amended):** A microdevice comprising a micro mixer having at least one means of creating a time-varying force field for inducing homogenization of sample components within a micro mixer channel at a rate greater than that of diffusion alone, whereby the homogenization of the sample components is effected by chaotic motion between the components.

**Claim 23 (currently amended):** A method of inducing sample mixing utilizing a micro mixer having at least one means of creating a time-varying force field for inducing homogenization of sample components within a micro mixer channel at a rate greater than that of diffusion alone, whereby the homogenization of the sample components is effected by chaotic motion between the components.

**Claim 24 (currently amended):** A micro mixer having at least one means of creating a time-varying electrical field for inducing homogenization of a first and second sample component within a micro mixer channel at a rate greater than that of diffusion alone, and wherein the time-varying force field creates a transverse force upon a sample interface between the first and second sample component;

wherein the electrical field creates a transverse force using at least one electrode inside the micro mixer channel, and wherein the electrode is activated to a selected first voltage and subsequently modulated to a second selected voltage at a selected interval to induce electrokinetic perturbations in the sample interface, whereby the homogenization of the first sample component and the second sample component is effected by chaotic motion between the components.

**Claim 25 (currently amended):** A micro mixer having at least one means of creating a time-varying electrical field for inducing homogenization of a first and second sample component within a micro mixer channel at a rate greater than that of diffusion alone, and wherein the time-

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varying electrical field creates a transverse force upon a sample interface between the first and second sample component;

wherein the time varying electrical field creates a transverse force by application of at least a first voltage at a first frequency by a first electrode and application of at least a second voltage at a second frequency by a second electrode, and wherein the first voltage and/or first frequency of the first electrode is modulated at a selected interval, and wherein the second voltage and/or second frequency of the second electrode is not modulated;

wherein the first and the second electrodes are positioned inside the channel to induce a folding and stretching effect on an interface between the first and the second sample components, whereby the homogenization of the first sample component and the second sample component is effected by chaotic motion between the components.